

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An exclusion controller which allows an information processing unit to acquire a contended resource to the exclusion of other information processing units, the exclusion controller comprising:

a storage area including

i) a prioritized information processing unit information storage area for storing information for identifying a prioritized information processing unit that is to execute writes for acquiring a contended resource by using normal write instructions;

ii) a prioritized exclusion right information storage area for storing information indicating whether the prioritized information processing unit is trying to acquire the contended resource; and

iii) a non-prioritized exclusion right information storage area for storing non-prioritized exclusion right information that indicates whether a non-prioritized exclusion right has been acquired by a non-prioritized information processing unit,

a plurality of non-prioritized information processing units mutually exclusively acquiring a non-prioritized exclusion right by a first process using the information in the non-prioritized exclusion right information storage area to determine that the non-prioritized exclusion right information has not yet been stored, the non-prioritized exclusion right indicating a candidate for acquiring the contended resource, the first process executing writes by using compare-and-swap instructions; and

a prioritized information processing unit identified by the prioritized information processing unit information storage area acquiring the contended resource by a second process to the exclusion of the non-prioritized information processing unit having acquired the non-prioritized exclusion right, the exclusion being determined from the non-prioritized exclusion right information storage area, updating the information in the prioritized exclusion right

information storage area to indicate that the prioritized information processing unit is trying to acquire the contended resource, the second process executing writes by using normal write instructions.

2. (Currently Amended) The exclusion controller according to claim 1, further comprising:

~~a prioritized exclusion right storage area for storing prioritized exclusion right information indicating that the prioritized information processing unit is trying to acquire the contended resource; and~~

~~a non-prioritized exclusion right storage area for storing non-prioritized exclusion right information indicating which of the plurality of non-prioritized information processing units has acquired the non-prioritized exclusion right,~~

wherein each non-prioritized information processing unit executes, as the first process, a process for storing the non-prioritized exclusion right information indicating that the non-prioritized information processing unit has acquired the non-prioritized exclusion right, to the exclusion of the other non-prioritized information processing units if the non-prioritized exclusion right information has not yet stored, and

the prioritized information processing unit executes, as the second process, a process for storing the prioritized exclusion right information and then reading the non-prioritized exclusion right storage area, and acquires the contended resource if the non-prioritized exclusion right information is not stored, but does not acquire the contended resource if the non-prioritized exclusion right information has already stored.

3. (Original) The exclusion controller according to claim 2, further comprising:

an area usage type storage area for storing information indicating which of the non-prioritized exclusion right information or prioritized information processing unit information the non-prioritized exclusion right storage area stores, wherein the non-prioritized exclusion right storage area stores any one of the non-prioritized exclusion right information and the prioritized information processing unit information indicating which of the plurality of information processing units is the prioritized information processing unit, and

each of the prioritized information processing unit and the plurality of non-prioritized information processing units acquires the non-prioritized exclusion right by the first process if the non-prioritized exclusion right storage area stores the non-prioritized exclusion right information, and the information processing unit acquires the contended resource if the information processing unit has acquired the non-prioritized exclusion right.

4. (Original) The exclusion controller according to claim 2, further comprising a prioritized information processing unit change unit for changing the prioritized information processing unit into a non-prioritized information processing unit if non-prioritized exclusion right information has been already stored, in the second process.

5. (Original) The exclusion controller according to claim 2, further comprising:

an acquisition check unit for checking whether the acquisition of the contended resource by any one of the first and second processes has failed; and

a monitor control unit for executing exclusion control by a monitor mode in which all the information processing units waiting to acquire the contended resource are previously recorded and the information processing unit having released the contended resource notifies the information processing units waiting to acquire the contended resource that the contended resource has been released, if a check has been made that the acquisition of the contended resource has failed.

6. (Original) The exclusion controller according to claim 1, further comprising:

a prioritized information processing unit information storage area for storing prioritized information processing unit information indicating which of the information processing units is the prioritized information processing unit; and

a prioritized information processing unit setting unit for allowing any one of the plurality of information processing units to execute a process for storing, in the prioritized information processing unit information storage area, the prioritized information processing unit information indicating that the information processing unit is the prioritized information processing unit, to the exclusion of the other information processing units if the prioritized information processing unit information has not been stored.

7. (Original) The exclusion controller according to claim 1, further comprising a prioritized information processing unit setting unit for setting the information processing unit having first acquired the contended resource as the prioritized information processing unit and for setting the other information processing units except the prioritized information processing unit as the non-prioritized information processing units.

8. (Original) The exclusion controller according to claim 1, further comprising prioritized information processing unit change unit for changing any one of the non-prioritized information processing units into the prioritized information processing unit.

9. (Original) The exclusion controller according to claim 8, further comprising:

a full stop unit for stopping all of the plurality of information processing units,
wherein the prioritized information processing unit change unit changes the non-prioritized information processing unit having acquired the contended resource at the time when all of the plurality of information processing units are stopped, into the prioritized information processing unit.

10. (Original) The exclusion controller according to claim 1, further comprising:

a resource information storage area for storing resource information indicating whether the contended resource has been acquired by any one of the plurality of information processing units, while associating the resource information with priority right information indicating that the prioritized information processing unit exists,

wherein the prioritized information processing unit executes, as the second process, a process for reading information from the resource information storage area and for writing the resource information in the resource information storage area if the priority right information is stored, and

wherein each non-prioritized information processing unit comprises:

a prioritized information processing unit stop unit for stopping the prioritized information processing unit;

a priority right removal unit for removing the priority right information from the resource information storage area by the first process exclusively from the other information processing units after the prioritized information processing unit stop unit has stopped the prioritized information processing unit;

a transient state check unit for checking whether the stopped prioritized information processing unit is executing the second process; and

an execution state setting unit for setting an execution state of the prioritized information processing unit to a state in which the prioritized information processing unit is not acquiring the contended resource by the second process, if a check has been made that the prioritized information processing unit is executing the second process.

11. (Original) The exclusion controller according to claim 10, wherein the execution state setting unit sets the execution state by setting execution location information indicating an execution location of a program realizing the prioritized information processing unit to be in a state before the resource information storage area is read.

12. (Original) The exclusion controller according to claim 10, wherein the execution state setting unit invalidates a process for writing in the resource information storage area in the second process.

13. (Original) The exclusion controller according to claim 10, further comprising a monitor control unit for executing exclusion control by a monitor mode in which all the information processing units waiting to acquire the contended resource are previously recorded and the information processing unit having released the contended resource notifies the information processing units waiting to acquire the contended resource that the contended resource has been released, if information indicating that the prioritized information processing unit does not exist has been stored in the resource information storage area.

14. (Canceled)

15. (Currently Amended) An exclusion control method for allowing an information processing unit to acquire a contended resource to the exclusion of other information processing units, the exclusion control method comprising:

a prioritized information processing unit information storage area storing information for identifying a prioritized information processing unit that is to execute writes for acquiring a contended resource by using normal write instructions;

a prioritized exclusion right information storage area storing information indicating whether the prioritized information processing unit is trying to acquire the contended resource;

a non-prioritized exclusion right information storage area storing non-prioritized exclusion right information that indicates whether a non-prioritized exclusion right has been acquired by a non-prioritized information processing unit;

a plurality of non-prioritized information processing modules for mutually exclusively acquiring a non-prioritized exclusion right by a first process using the information in the non-prioritized exclusion right information storage area to determine that the non-prioritized exclusion right information has not yet been stored, the first process executing writes by using compare-and-swap instructions, the non-prioritized exclusion right indicating a candidate for acquiring the contended resource; and

a prioritized information processing module identified by the prioritized information processing unit information storage area for acquiring the contended resource by a second process to the exclusion of the non-prioritized information processing unit having acquired the non-prioritized exclusion right, the exclusion being determined from the non-prioritized exclusion right information storage area, updating the information in the prioritized exclusion right information storage area to indicate that the prioritized information processing unit is trying to acquire the contended resource, the second process executing writes by using normal write instructions.

16. (Canceled)

17. (Original) A program for causing a computer to function as an exclusion controller which allows an information processing unit to acquire a contended resource to the exclusion of other information processing units, the program causing the computer to effect the functions of claim 1.

18. (Canceled)

19. (Currently Amended) A recording medium having a program recorded thereon, the program causing a computer to function as an exclusion controller which allows an information processing unit to acquire a contended resource to the exclusion of other information processing units,

wherein the program causes the computer to function as:

a prioritized information processing unit information storage area storing information for identifying a prioritized information processing unit that is to execute writes for acquiring a contended resource by using normal write instructions;

a prioritized exclusion right information storage area storing information indicating whether the prioritized information processing unit is trying to acquire the contended resource;

a non-prioritized exclusion right information storage area storing non-prioritized exclusion right information that indicates whether a non-prioritized exclusion right has been acquired by a non-prioritized information processing unit

a plurality of non-prioritized information processing units mutually exclusively acquiring a non-prioritized exclusion right by a first process using the information in the non-prioritized exclusion right information storage area to determine that the non-prioritized exclusion right information has not yet been stored, the first process executing writes by using compare-and-swap instructions, the non-prioritized exclusion right indicating a candidate for acquiring the contended resource; and

a prioritized information processing unit identified by the prioritized information processing unit information storage area acquiring the contended resource by a second process to the exclusion of the non-prioritized information processing unit having acquired the non-prioritized exclusion right, the exclusion being determined from the non-prioritized exclusion right information storage area, updating the information in the prioritized exclusion right information storage area to indicate that the prioritized information processing unit is trying to acquire the contended resource, the second process executing writes by using normal write instructions.

20. (Canceled)

21. (Original) A computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing exclusion control, the computer readable program code means in said computer program product comprising computer readable program code means for causing a computer to effect the functions of claim 1.

22. (Previously Presented) A computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing exclusion control, the computer readable program code means in said computer program product comprising computer readable program code means for causing a computer to effect the functions of claim 15.

23. (Original) An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing exclusion control, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of claim 15.

24. (Original) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for exclusion control, said method steps comprising the steps of claim 15.

25-26. (Canceled)